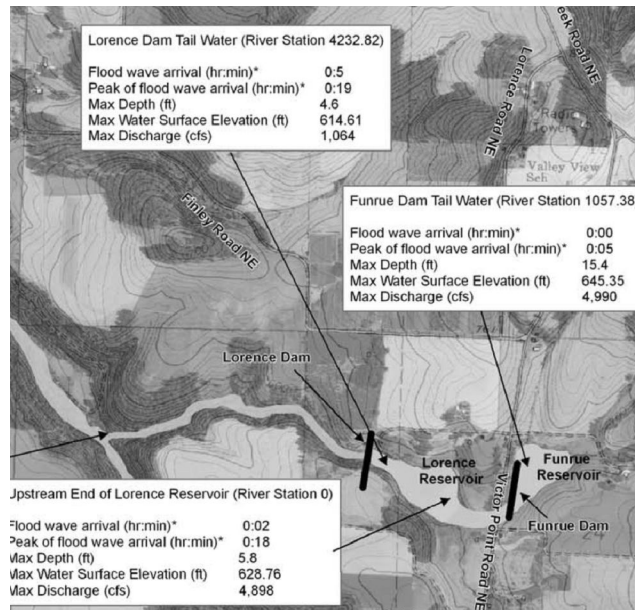


Emergency Action Plans in Oregon: An example of “Soft Regulation”

E. George Robison
Dam Safety Coordinator



Inundation map for an Oregon dam supported with an “EAP assistance grant”

Dam Safety Program and Initiatives

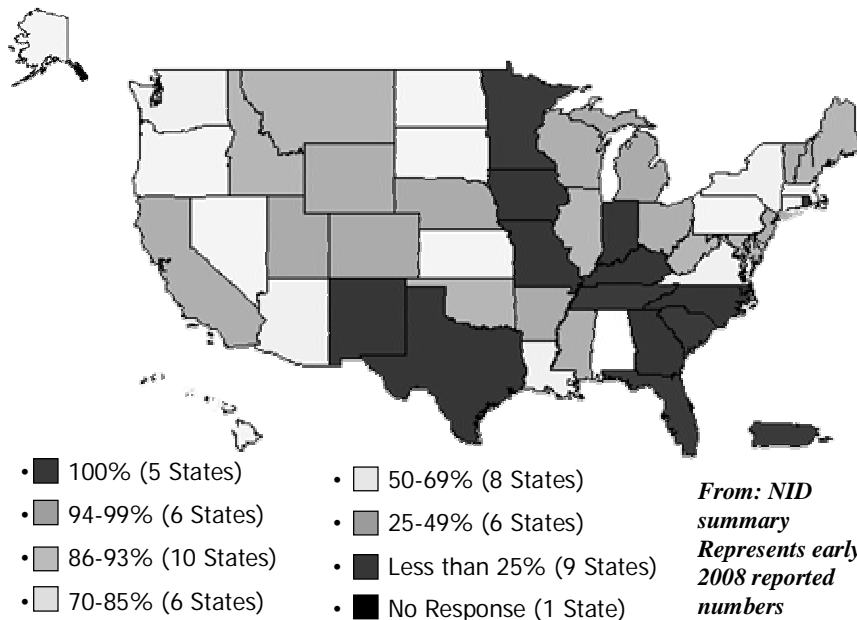
- Core Programs
 - Inspections of Existing Dams
 - Review of Plans and Specifications
- Initiatives
 - Emergency Action Plans (EAPs)
 - Reducing Inspection Backlog
 - Hazard Classification Check
 - Spillway Study

The Problem



- In fall 2007:**
 - Oregon had 50/122 high hazard dams without EAPs**

How does Oregon Stack up with other states?



Number of EAPs for High Hazard Potential Dams - 2007

State	Total # State Reg High Haz Pot	# High Haz Pot w/EAP	% High Haz Pot w/EAP	State	Total # State Reg High Haz Pot	# High Haz Pot w/EAP	% High Haz Pot w/EAP
Puerto Rico	34	35	103%	Connecticut	226	162	72%
Florida	72	72	100%	Arizona	96	68	71%
Minnesota	23	23	100%	Oregon	122	83	68%
South Carolina	153	153	100%	South Dakota	47	31	66%
Tennessee	148	148	100%	Hawaii	97	63	65%
Colorado	352	345	98%	Nevada	165	107	65%
New Jersey	213	208	98%	New York	391	252	64%
Utah	192	186	97%	Alaska	18	11	61%
Michigan	84	80	95%	Kansas	198	113	57%
Arkansas	103	98	95%	North Dakota	29	16	55%
Nebraska	124	116	94%	Wyoming	79	37	47%
Maine	25	23	92%	Wisconsin	189	85	45%
West Virginia	245	225	92%	Ohio	375	160	43%
New Hampshire	106	97	92%	California	687	279	41%
Montana	102	93	91%	Mississippi	265	72	27%
Illinois	187	170	91%	Vermont	57	14	25%
Pennsylvania	781	710	91%	North Carolina	1153	246	21%
Oklahoma	286	257	90%	Texas	888	141	16%
Delaware	9	8	89%	Indiana	240	19	8%
Maryland	68	60	88%	New Mexico	181	13	7%
Idaho	107	93	87%	Missouri	462	25	5%
Virginia	143	122	85%	Iowa	83	4	5%
Washington	145	121	83%	Kentucky	178	7	4%
Massachusetts	303	248	82%	Georgia	457	14	3%
Louisiana	29	21	72%	Rhode Island	95	2	2%
				Alabama	0	0	0

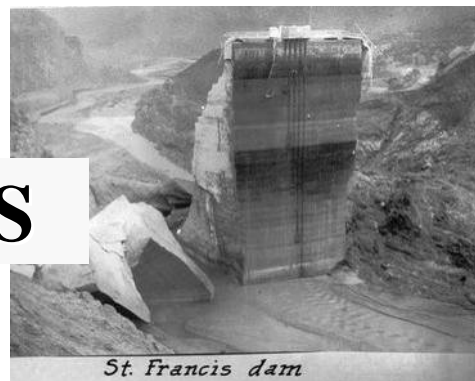
From: NID summary: Represents early 2008 reported numbers



**Teton Dam – BOR
Idaho 1976**

Dam failure with warning 11 dead

VS



St. Francis dam

Dam Failure w/o warning 400+ Dead

Key Issue:

Oregon Statutes have no mechanism to force an existing dam owner to produce an emergency action plan.

Can use conditioning and approval process to require new dam owners to have an EAP



How to get needed compliance without a “regulatory hammer”

Possible tools

- **Create incentives**
- Educate regarding the need
- Communicate the need on a regular basis
- Create tools to make producing an EAP easier



Artist depiction of South Fork Dam Failure from Pierce et.al. 2008

Create Grant Program for EAPs

- Used Federal FEMA funding
 - \$5000 “assistance grant”
 - Create streamlined application process (able to do this with smaller grant amount)
 - While not required we have had considerable matching – Example: City of Newport received 2 grants (\$10,000 total) and spent over \$40,000 to produce EAP



Upper Big Creek Dam
City of Newport

Assistance Grants

- Federal Fiscal Year 2007-2008:
 - 6 Grants leading to 4 EAPs and one inundation study
 - Federal Fiscal Year 2008-2009 :
 - 4 Grants leading to 3 EAPs and one inundation study
 - Also direct funding for Inundation Study
 - Federal Calender Year 2009-2010 (projected):
 - 6 Grants for EAPs
 - 1 Direct Funded Inundation study
- *Note some EAPs funded by grants are still in development.
- *Because of the letters informing owners about grants and the importance of EAPs, several dam owners completed EAPs without grants.

How to get needed compliance without a “regulatory hammer”

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*Artist depiction of South Fork Dam Failure
from Pierce et.al. 2008*

- Received training on EAPs – ASDSO
- Training on using HEC-RAS and HEC HMS
- Upgraded Website with Informational Materials
- Inserted information about Emergency Information Plans for inspection letters for all high hazard dams without them.
- Sent out directed mailing announcing the grant program and also explaining the importance of EAPs.

Education on Why EAPs Important



W. Graham, Bureau of Reclamation

Making the Case to Dam Owners

- It is in their own best interest in that it represents state of the art and if any issues arise they are “covered”
- Part of the plan is to know how to respond to an emergency situation and possibly save the dam – saving considerable money compared to a possible loss of the dam.
- Having resource agreements in place ahead of time can save money if a problem ever develops

Communicating the need

- Website updated with an EAP emphasis
- Inspection letters
- Two targeted letters
- Two of our keynote general session talks had significant portions dedicated to EAP issues at our most recent dam conference.



Simplot failure near Morrow Oregon

How to get needed compliance without a “regulatory hammer”

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- Create incentives
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*Artist depiction of South Fork Dam Failure
from Pierce et.al. 2008*

Tools

- Web site materials
 - Example EAPs
 - Checklists
 - Fillable EAP
- List of consultants interested in EAPs and/or inundation studies
- New rules and guidance document under development



Reclassification

- ~800 Low and Significant Hazard Dams Reviewed using GIS and Google Earth
- 123 Rated as possible re-class
- Will do further review and field review on a subset of these. Twelve so far have been classed higher.
- Letter to all high hazard dam owners without EAPs offering to review classification. So far seven dams down-classed



Image generated from Google Earth

Progress on EAPs

- Out of 127 High Hazard Dams – Number of dams without emergency action plans has been reduced from 50-26 from mid 2007 to present.
- This translates to an 80% completion percentage
- Of the remaining 26 dams, 6 are in some stage of EAP development
- Goal is all high hazard dams to eventually have EAPs



Conclusion

- Without strong regulatory clauses there is a need to use "soft regulation" to meet needed goals and provide for dam safety
- So far, the use of incentives, and providing information and tools to create EAPs is accelerating their development.

